



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,124	01/03/2006	Koji Abe	MAM-071	1181
20374	7590	03/05/2009	EXAMINER	
KUBOVCIK & KUBOVCIK SUITE 1105 1215 SOUTH CLARK STREET ARLINGTON, VA 22202				HAN, KWANG S
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
03/05/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/563,124	ABE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kwang Han	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 04 December 2008.

2a) This action is **FINAL**.                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-9 and 11 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-9 and 11 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date <u>11/17/08</u> .	6) <input type="checkbox"/> Other: _____ .

**NONAQUEOUS ELECTROLYTE SECONDARY BATTERY**

Examiner: K. Han SN: 10/563,124 Art Unit: 1795 March 5, 2009

**DETAILED ACTION**

1. The Applicant's amendment filed on December 4, 2008 was received. Claim 10 was cancelled. Claim 1 was amended.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 102***

3. The claim rejections under 35 U.S.C. 102(b) as being anticipated by Hamamoto et al. (US 6436582) on claim 10 is withdrawn because claim 10 has been cancelled.

***Claim Rejections - 35 USC § 103***

4. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Hamamoto et al. in view of Cho et al. (US 6436582) on claims 1, 2, 4, 5, and 7 are withdrawn, because independent claim 1 has been amended.
5. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Hamamoto et al. in view of Cho et al. (US 6436582) as applied to claim 1 and further in view of Hibara et al. (JP 2002-158035) on claims 3, 6, and 11 are withdrawn, because independent claim 1 has been amended.

Art Unit: 1795

6. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Hamamoto et al. in view of Cho et al. (US 6436582) as applied to claim 1 and further in view of Ogino et al. (US 5153082) on claims 8-9 are withdrawn, because independent claim 1 has been amended.

7. Claims 1, 2, 4, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamamoto et al. (US 6436582) in view of Gao et al. (US 6277521).

Regarding claims 1 and 2 Hamamoto et al. is directed towards a nonaqueous electrolyte lithium secondary battery (Column 1, Lines 9-13) comprised of the following:

- a negative electrode containing a graphite material as the negative active material (Column 4, Lines 7-16), and
- an electrolyte containing 1 wt % of a sulfonyl-containing compound (Column 2, Lines 31-54; Column 7, Lines 7-11).

Hamamoto et al. discloses a cathode material comprised of lithium cobalt oxide (Column 3, Line 63-64) but is silent towards the group IVA and IIA elements.

Gao teaches a lithium secondary battery with a positive electrode comprised of an exemplary intercalation compound  $\text{LiNi}_{0.7}\text{Co}_{0.15}\text{Ti}_{0.05}\text{Mg}_{0.05}\text{O}_2$  which has a 1.6 mol % of a Group IVA element (Ti) and 1.6 mol % of a Group IIA element because it provides significant improvement in the irreversible capacity and cycleability of the intercalation compound (Column 2, Line 66-Column 3, Line3; Column 4, Line 60-Column 5, Line 5). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a intercalation lithium cobalt oxide compound with 1.6 mol % of a Group IVA

element and a Group IIA element in the positive active material because Gao teaches it provides a lithium secondary battery with improvement in irreversible capacity and cycleability.

Regarding claim 4, Hamamoto et al. discloses a sulfonyl-containing compound that is 1,4 butanediol dimethanesulfonate (Column 2, Lines 49-53).

Regarding claim 5, Hamamoto et al. discloses 1,4 butanediol dimethanesulfonate in an amount at 1 wt% (Column 7, Lines 7-11).

Regarding claim 7, Hamamoto et al. discloses a nonaqueous electrolyte solution containing diethyl carbonate (Column 3, Lines 27-28).

8. Claim 3, 6, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamamoto et al. in view of Gao et al. as applied to claim 1 above, and further in view of Hibara et al. (JP 2002-158035, machine translation).

Regarding claims 3 and 11, the teachings of Hamamoto et al. and Gao et al. as discussed above are herein incorporated. Hamamoto and Cho are silent towards the use of a vinylene carbonate in the electrolyte.

Hibara et al. teaches the use of vinylene carbonate within the electrolyte composition for a nonaqueous electrolyte for a secondary battery [0052] in an amount ranging from 0.05 to 5 wt% [Claim 5] for the benefit of providing an electrolyte that better suppresses reduction decomposition of the electrolyte [0051, Abstract]. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply

Hibara's vinylene carbonate in the electrolyte of Hamamoto modified by Gao's battery for the benefit of better suppressing reduction decomposition of the electrolyte.

It has been held that where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (MPEP 2144.05)

Regarding claim 6, the teachings of Hamamoto et al. and Gao et al. as discussed above are herein incorporated. Hamamoto et al. and Cho et al. are silent towards the use of a divinyl sulfone in the electrolyte for the secondary battery.

Hibara et al. teaches the use of divinyl sulfone [0048-0050; Claims 5, 8] in a nonaqueous electrolyte for a secondary battery in an amount between 0.05 to 1 wt % for the benefit of providing control for the reduction peak [Abstract]. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Hibara's divinyl sulfone in Hamamoto modified by Cho's nonaqueous electrolyte for the benefit of providing control for the reduction peak. It has been held that where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (MPEP 2144.05)

9. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamamoto et al. in view of Gao et al. as applied to claim 1 above, and further in view of Ogino et al. (US 5153082).

Regarding claims 8 and 9, the teachings of Hamamoto et al. and Gao et al. as discussed above are herein incorporated. Hamamoto et al. and Gao et al. are silent as to a charge capacity ratio at a specified potential.

Ogino et al. teaches a nonaqueous electrolyte secondary battery in which the negative electrode and positive electrode materials are selected to vary the charge capacity [Abstract]. It is further taught that the electrodes thicknesses can be varied to adjust the capacity ratio (Column 7, Lines 47-59) to improve the charge/discharge and overdischarge properties (Column 8, Line 65-Column 9, Line 4) thereby teaching it as a result effective variable. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Ogino's charge capacity variations in Hamamoto and Gao's battery for the benefit of improving the charge/discharge and overdischarge properties. The courts have held that optimization of a results effective variable such as the ratio of charge capacity between a positive and negative active material is not novel.

In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

### ***Response to Arguments***

10. Applicant's arguments filed December 4, 2008 have been fully considered but they are not persuasive.

*Applicant's principal arguments are:*

*(a) the Cho reference in combination with Gao does not teach a group IVA and IIA element contained in the LiCoO<sub>2</sub>.*

In response to Applicant's arguments, please consider the following comments:

(a) the Cho reference does teach a positive active material by the formation of a coating layer in combination including group IVA and IIA elements [0033] with a lithiated intercalation compound such as LiCoO<sub>2</sub> [0056]. Cho further teaches that the lithiated compound and the solid-solution compound of the coating layer are reacted together to form the positive active material [0032, 0036]. The original claim language states that the lithium cobalt oxide contains a group IVA element and a group IIA element which would be satisfied by the formation of a coating layer which are reacted together. Newly amended matter of the mol percentage of the elements have been addressed by the new grounds of rejection.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact/Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. H./  
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1795